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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,387	06/29/2006	Brian Gordon Stewart	031749/297914	1924

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EXAMINER	
PATEL, DHAVAL V	
ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,387	STEWART, BRIAN GORDON	
	Examiner	Art Unit	
	DHAVAL PATEL	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *58-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *58-61,63-67 and 69-74* is/are rejected.

7)☒ Claim(s) *62 and 68* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination (RCE)

1. The request filed on 4/14/2011, for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application # 10549387 is acceptable and a RCE as been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;
c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

3. **Claims 58-61,63, 65-67,69, 70, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 7,248,559) (hereafter Ma) in view of Schafer et al. (WO 93/09622)(hereafter Schafer) and further in view of McCallister et al. (US 5,878,085)(hereafter McCallistser).**

Regarding claim 58, Ma discloses a method for encoding data for transmission over a telecommunications network comprising embedding a control data block within a plurality of real data blocks (Fig. 2, coding, modulation, 12, pilot insertion block, 24 which inserts the pilots in the data signal, here, mapping of the data would generate the I and Q data since mapping is done in I-Q form); convoluting real data in each real data block with at least some of the control data in the control data blocks (Fig. 2, since pilot insertion in which the upper branch (16) generates the pilot insertion in the upper and lower branch since, pilot is inserted into data, data and pilots are added to each other which is construed as convolution); modulating or transforming the convoluted real data in the real data blocks with one or more sub-carrier signals; and modulating or transforming data in the control data block with every sub-carrier that is used to modulate the real data (Fig. 2, IFFT (26) which generates the transformation of pilot insertion data (24) which is convolved data for modulation, since, data and pilot are added together, both will be processed for IFFT modulation).

Ma does not explicitly disclose a method, wherein each entry of the control data block has a phase angle that is a function of the phase angles of the corresponding entries of the real data blocks.

However, in the same field of endeavor, Schefer teaches in col. 4 lines 10-15 discloses phase of the pilot sub carriers depends only on the sub carrier index p (l, k). if an additional phase rotation is a function of the sub carrier index and OFDM symbol, so, here, convolution is there since, there is a phase relationship between each symbol and phase of the pilot sub carrier. Note that each information or data entry also has certain

phase as examiner mentioned before during interview with the applicant's representatives. So, there is always phase relationship depends upon the modulation scheme is performed.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate the teachings of Schefer, into the system of Ma, as a whole, to insert the predefined or predetermined pilot pattern into the information bits before transmission, the motivation is to improve the channel estimation results at the receiver side.

Even though it's well known, the combined teachings do not explicitly teach data or information phase. However, in the same field of endeavor, McCallister teaches the trellis coded modulation in which the data bits are processed by the 4-phase different encoder, col. 6 lines 61-67 teaches the 8-PSK coding in which the phase mapper maps the possible phase points for each interval. Phase mapper implements code and binary code is characterized by phase increasing at an increment of certain phase and col. 7 lines 8-20 also teaches pilot insertion puncturing in symbols and also disclosed the secondary encoded streams of symbols of a first polarity are mapped to a phase point and all symbols of a second polarity are mapped to phase point of different phase.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of McCallister, into the system of Ma and Schafer, as a whole, to insert the pilot data into information symbols with having certain phase relationship between them, the motivation is to reduce the signal degradation.

Regarding claim 59, Ma further discloses a method, wherein each of the control and real data blocks has m entries (Fig. 2, data generated from branch which is S/P converted and pilot block (230 has multiple symbols) such as P1 and P2), where m is an integer of one or more, and m sub- carrier transmission channels are provided (Fig. 2, IFFT, which is sub carriers), and each control data entry and each real data entry are modulated with the corresponding sub-carrier (Fig. 2, modulation, 12 which generates I and Q data, and mapping on IFFT, since both pilot and data are combined, the IFFT modulation performed on both).

Regarding claim 60, Ma further discloses a method, wherein the step of convoluting involves phase angle convoluting each entry in each real data block with a phase angle of the corresponding entry in the control block (Fig. 2, convolving here is phase addition of pilot and data symbols).

Regarding claim 61, Ma further discloses a method, wherein the step of phase angle convoluting involves adding the phase angle of each entry of the control data block to the phase angle of the corresponding entry of each real data block (Fig. 2, convolving here is phase addition of pilot and data symbols).

Regarding claim 63, Ma does not explicitly disclose a method wherein each phase angle for control data is randomly assigned. However, in the same field of endeavor, Schafer teaches method, wherein each phase angle for the control data in

the control data block is randomly assigned (col. 5 lines 20-26 discloses pilot phases are randomly chosen). Therefore, it would have been obvious to one of ordinary skilled in the art to generate the pilot with the randomized method of Schafer, to generate the orthogonal control blocks, as well known in the art.

Regarding claims 65-67, the combined teachings as a whole discloses all the subject matter of modifying or convoluting the real data blocks with the pilot blocks, however, do not explicitly disclose that the each entry of the control data block is the sum of the phase angles of the corresponding entries of real data blocks and also subtracting the phase angles however, Schefer teaches in col. 4 lines 10-15 discloses phase of the pilot sub carriers depends only on the sub carrier index p (l, k). if an additional phase rotation is a function of the sub carrier index and OFDM symbol, so, here, convolution is there since, there is a phase relationship between each symbol and phase of the pilot sub carrier. Note that each information or data entry also has certain phase as examiner mentioned before during interview with the applicant's representatives. So, there is always phase relationship depends upon the modulation scheme is performed. Modifying the data with the pilot by adding or subtracting which is modifying the data in view of pilot in different ways is obvious to one of ordinary skilled in the art. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate the teachings of Schefer, into the system of Ma, as a whole, to insert the predefined or predetermined pilot pattern into the information

bits before transmission, the motivation is to improve the channel estimation results at the receiver side.

Regarding claim 69, the combined teachings of Ma and Schefer further teaches a method as claimed in claim 58, wherein the step of modulating comprises frequency modulating the signal (col. 1 lines 15-20, OFDM modulation)

Regarding claim 70, the combined teachings of Ma and Schefer further teaches a method as claimed in claim 58, comprising receiving data for transmission to a receiver, dividing the data into N-1 data blocks and embedding a the control data block into the N-1 data blocks to provide a N block data transmission (col. 5 lines 10-20, pilot arrangement within the data with different pilot phase profile, and pilot phase is dependent upon the OFDM symbol, col. 5 lines 20-26 discloses randomizing the pilots phases).

Regarding claim 73, Ma further discloses a system for encoding data for transmission over a telecommunications network according to the method of claim 58, the system preferably being a personal mobile communications device or mobile/radio telephone or a computer with telecommunications capabilities or a digital broadcast radio or a digital television or set top box or any wireless networked device (col. 1 lines 19-23, OFDM high speed radio transmission, Fig. 6, wireless communications)

4. **Claims 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma, Schefer and McCallister, as applied to claim 58 above, and further in view of Jasper et al. (WO 93/09622) (hereafter Jasper).**

Regarding claim 71, Ma, Schefer and McCallister do not explicitly disclose a method wherein the control data block is embedded substantially in the middle of the real data blocks. However, in the same field of endeavor, jasper teaches communication signal having a time domain pilot component in which page 10, lines 20-30 describes various pilot arrangements within information symbol. Fig. 1 describes pilot insertion process (108...110) and Fig. 4a-4d describes various pilot arrangement for sub channels 1-4 in which pilots symbols are embedded in substantially middle of the information system, therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Jasper, into the system of Ma, Schefer and McCallister, as a whole, so as to insert pilots in middle in random arrangement of pilots, the motivation is to provide robust technique in a varying multipath environment (page 4, lines 15-20).

Regarding claim 72, Ma, Schefer and McCallister do not explicitly disclose wherein the plurality of control data blocks are embedded within the real data blocks. However, in the same field of endeavor, Jasper, teaches communication signal having a time domain pilot component in which Figs. 4a-4g teaches various pilot arrangements within information symbol, in which Fig. 4g describes having multiple pilot symbols are

embedded within the information symbol, for example, in Fig. 4g, the two pilot symbols are inserted between the data symbols, therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Jasper, into the system of Schefer, as a whole, so as to incorporate multiple pilots within the information symbol, the motivation is to provide robust technique in a varying multipath environment (page 4, lines 15-20).

5. **Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma, Schafer and McCallister and further in view of Langberg et al. (US 5,852,850) (hereafter Langberg).**

Regarding claim 74, Claim discloses all the subject matter as described in claim 58, except for the method written by a computer code embodied in a computer readable-medium and having code or instructions for carrying out the method.

However, Landberg teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium and that configures and drives any suitable digital signal processor situated in communication device. The computer readable medium is an electronic, magnetic, optical or physical device or means that can be contain or store a computer program for use by or in connection with a computer related system or method (col. 1, lines 51-65). One skilled in the art would have clearly recognized that the method of Ma, Schafer and McCallister would have been implemented in software, The implemented software would perform same function of the hardware for less

expense, adaptability and flexibility, therefore, it would have been obvious to one ordinary skilled in the art at the time of the invention was made to us the software as taught by Landberg in the Ma, Scahfer and McCallister in order to reduce cost and improve adaptability and flexibility of the communication system.

Allowable Subject Matter

6. Claims 62 and 68 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,618,352 discloses the ***data corresponding to the phase and amplitudes of the transmission subcarriers on the frequency axis are converted into parallel data using and then processed by the IFFT.***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DHAVAL PATEL whose telephone number is (571)270-1818. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dhaval Patel/
Examiner, Art Unit 2611
5/8/2011